

# Regulations for EPA's Green Roof

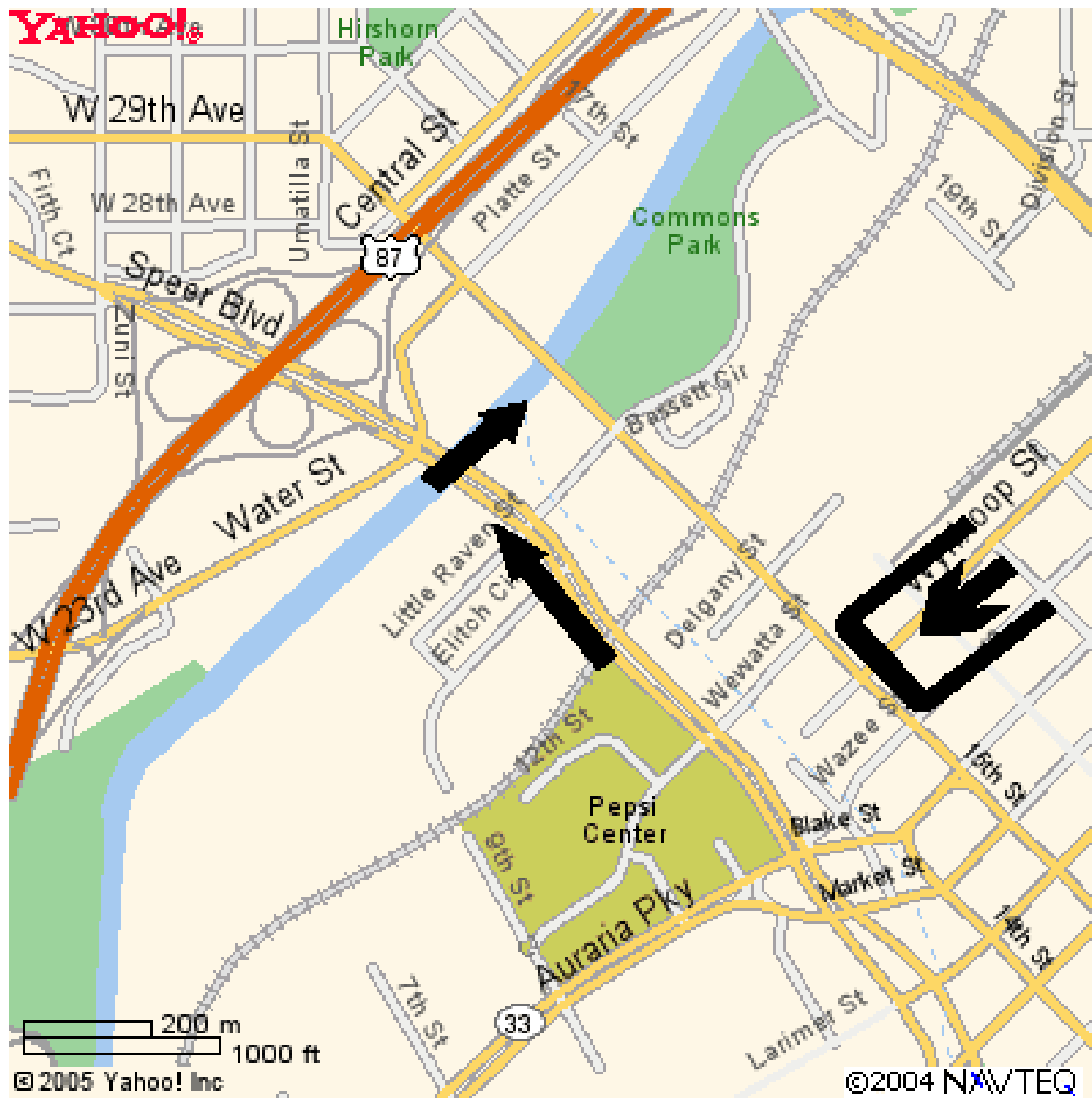
...It's a Storm Water BMP

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EPA Region 8  
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# In Denver, all storm water drains to the South Platte





Drainage  
path from  
EPA's  
Wynkoop  
Facility

# Storm water discharged to Denver's MS4 is regulated

- MS4 = Municipal Separate  
Storm Sewer System
- Regulations exist to ensure that  
designated uses in the water body can be  
maintained

# MS4 Permit Requirements

1. Commercial/ Residential Management Program
2. Illicit Discharges Management Program
3. Industrial Facilities Management Program
- 4. Construction Sites Program**
5. Municipal Facility Runoff Control Program

# New development planning procedures

... The permittee (Denver) shall continue to implement planning procedures and enforce controls to reduce the discharge of pollutants after construction is complete from new development and significant redevelopment

... All \*significant development or re-development shall be required to submit a plan that includes Best Management Practices as part of the development proposal

(\*significant = 1 acre)

Denver's green  
roof is a post-construction  
storm water BMP

...Regulated by the state of Colorado  
and the city of Denver

# Porous landscape detention



# Retention pond



# Sand filter detention basin



# Porous pavement detention



# Drainage criteria manual

- BMP planning for new development and significant re-development
  - Design criteria based on research
  - As new research is available the BMP manual will be updated

# Regulatory goals

- Evaluate performance as a post-construction storm water BMP
- Work with UDFCD and the city of Denver to establish green roof criteria for Denver
- Promote the use of green roofs in Denver as appropriate

# Monitoring

Weir box and automated sampler... for control and experimental inputs



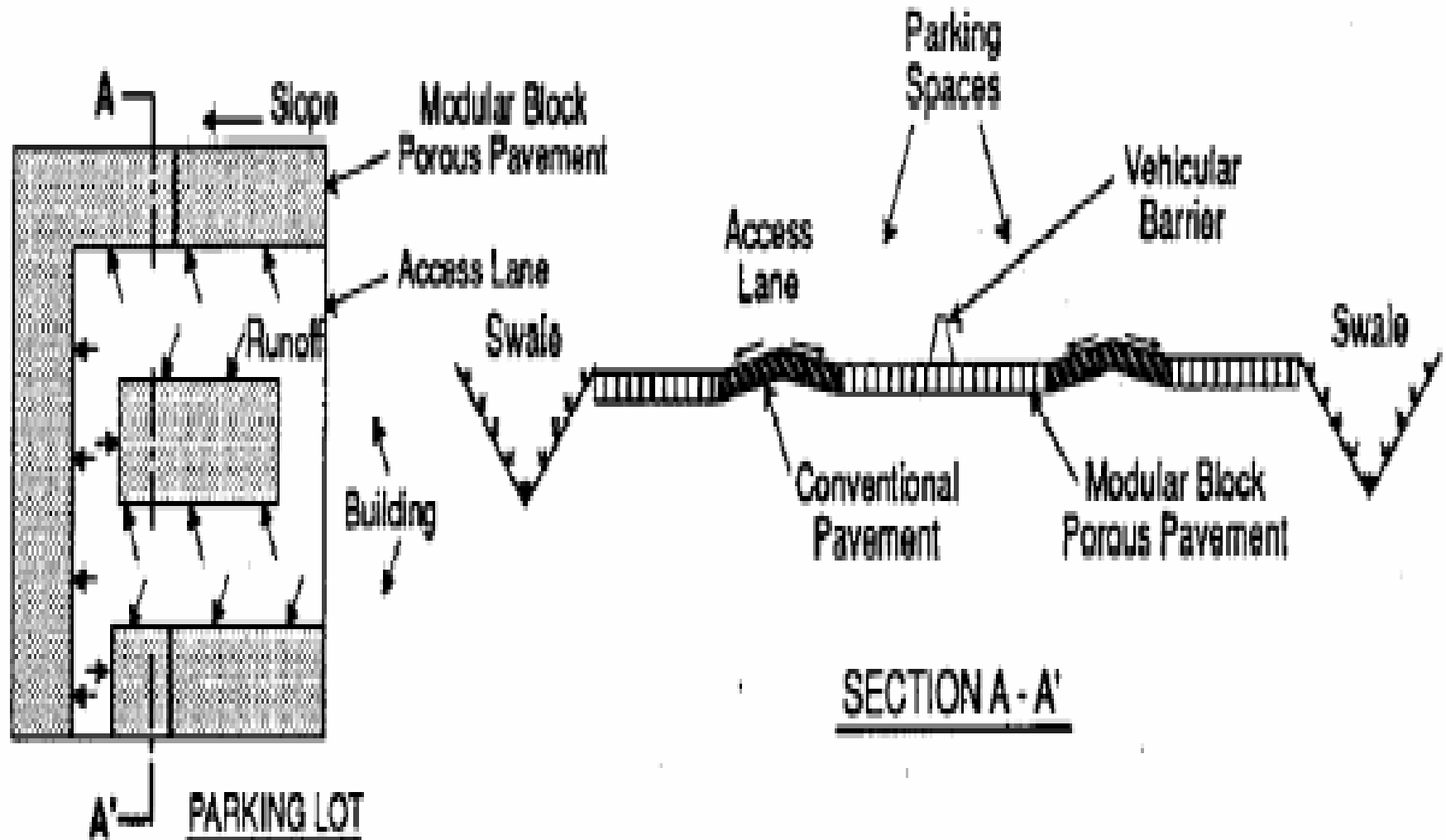
# Evaluating performance through monitoring

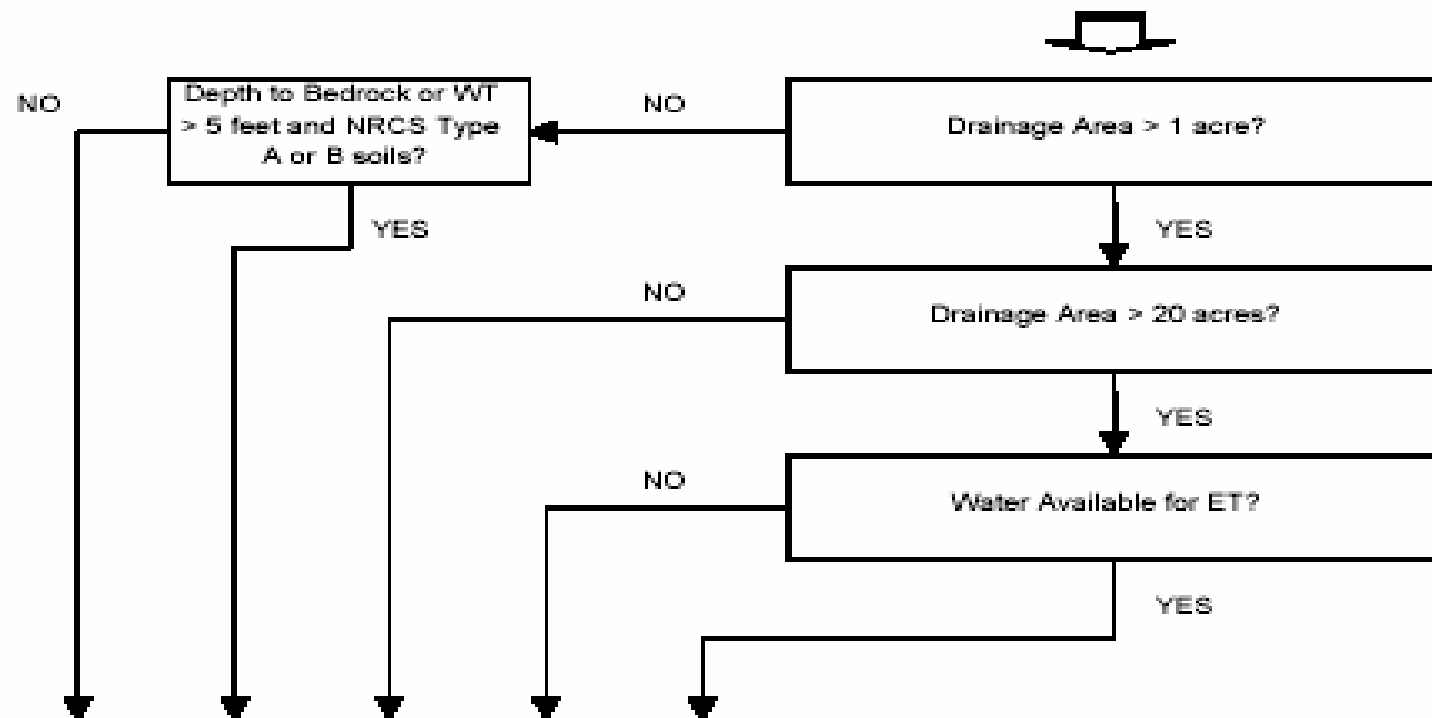
- Soil depths, vegetation types
- Storm water retention
- Water quality (pollutants of concern)
- Air quality impacts

# Receiving waters

- COSPUS14 – South Platte River
- Uses:
  - Agriculture
  - Aquatic Life Cold Water Cold Class 1
  - Domestic Water Source
  - Recreation Secondary Contact
- Impairments:
  - Nitrate
  - Fecal coliform
  - E. coli

# Establishing criteria with Denver





**Suitable WQCV BMP**

<input type="radio"/>					Porous Pavement Detention (PPD) with Underdrain
	<input type="radio"/>				Porous Pavement Detention (PPD) with Infiltration
<input type="radio"/>					Porous Landscape Detention (PLD) with Underdrain
	<input type="radio"/>				Porous Landscape Detention (PLD) with Infiltration
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extended Detention Basin (EDB)
		<input type="radio"/>			Sand Filter Extended Detention Basin (SFB)
				<input type="radio"/>	Construction Wetland Basin (CWB)
				<input type="radio"/>	Retention Pond (RP)

# Promoting green roofs

- Coordinating with the city of Denver and Urban Drainage
- Providing accessible information
- Promotion of non-regulatory impacts
- Site tours